

REMARKS

Applicant gratefully acknowledges the indication that claims 3, 5, and 18 contain allowable subject matter. However, Applicant respectfully traverses the rejections of claims 1, 2, 4, 6, 7, 8, 17, 18, and 19. Before addressing the particulars of these rejections, Applicant notes the following features of embodiments of the invention. For example, consider Figure 1, which illustrates a diffraction grating (element 155) that diffracts light from source 180 into a diffracted beam 150. Depending upon the angle of the diffraction grating with respect to incident beam 145 from source 180, the diffracted beam will be predominately red, or green, or blue. Thus, LC microdisplay panel 110 may receive these diffracted beams (in sequence) and modulate them accordingly. Thus, when the diffraction grating is rotated at an angle such that the diffracted beam received by the LC microdisplay panel is red, the LC microdisplay panel may modulate this red light into a red sub-frame of an image. Similarly, when the diffraction grating is rotated at an angle such that the diffracted beam received by the LC microdisplay panel is green, the LC microdisplay panel may modulate this green light into a green sub-frame of the image. Finally, when the diffraction grating is rotated an angle such that the diffracted beam received by the LC microdisplay panel is blue, the same LC microdisplay panel may modulate this blue light into a blue sub-frame of the image.

Note how elegantly simple this color projection system is: no complicated alignment optics are necessary to project appropriately colored light onto corresponding sub-pixels. Instead, the claimed LC microdisplay panel is akin to a mirror – if you shine red light on it, it looks red. If you shine blue light on it, it looks blue, etc. When the claimed LC microdisplay is receiving a colored light beam, it modulates the colored light

into the corresponding sub-frame. This is illustrated, for example, with respect to Figure 5 for two consecutive video frames. It will be appreciated that many alternative embodiments may be implemented using this same inventive concept such by replacing the single diffraction grating with three separate gratings, each grating being specialized for the diffraction of one of the R, G, and B colors as discussed with respect to Figure 8a and 8b. Moreover, both the diffraction grating and the LC panel may be implemented in either a reflective or transmissive mode.

These inventive features are reflected in claim 1, which includes the limitations of "at least one diffraction grating configured to diffract light from the lamp into a diffracted beam; and an LC microdisplay panel configured to receive the diffracted beam from the diffraction grating, wherein by moving the at least one diffraction grating with respect to the light from the lamp, the diffracted beam received by the LC microdisplay sequentially comprises a diffracted red beam, a diffracted blue beam, and a diffracted green beam, the LC microdisplay panel being configured to sequentially modulate the diffracted red beam into a red sub-frame of an image, the diffracted green beam into a green sub-frame of the image, and the diffracted blue beam into a blue sub-frame of the image." No new matter is added, the support being as discussed above.

The cited prior art stands in sharp contrast. Specifically, none of these references discloses or suggests the use of at least one diffraction grating that may be moved to sequentially provide a diffracted red, green, and blue beam to an LC microdisplay panel, "the LC microdisplay panel being configured to sequentially modulate the diffracted red beam into a red sub-frame of an image, the diffracted green beam into a green sub-frame of the image, and the diffracted blue beam into a blue sub-frame of the image." For

example, the Ishikawa reference discloses a complex projection scheme that does include a diffraction grating. However, this diffraction grating is merely used to split the light, which is then further processed by a lenticular lens into multiple subbands of colors such as those shown in Figure 3. As discussed in Col 6, these subbands of colors scan across DMD panel 8. Thus, the DMD panel cannot possibly perform the simple (yet elegant) modulation of just one primary color at a time into the corresponding sub-frame as discussed with respect to claim 1. Indeed, as set forth in Col. 7, lines 20-21, Ishikawa explicitly states that “most of the red, green and blue light can be employed simultaneously.” Accordingly, claim 1 is patentable over the Ishikawa reference.

The Hayashi publication (2003/0206348) adds nothing further. This reference teaches the use of sub-pixels as discussed in the Applicant’s background section. For example, consider Figure 9 of this publication, which illustrates the R,G, B sub-pixels. Complicated optical alignment means or “pixel shifting means” must be used to illuminate the red pixels with red light, the green pixels with green light, and the blue pixels with blue light, all precisely and simultaneously. The Hayashi patent (USP 6,540,361) provides the same teaching – the RGB sub-pixels are discussed, for example, in the abstract. Accordingly, claim 1 is patentable over the cited prior art.

Because claims 2 through 8 depend either directly or indirectly upon claim 1, these claims are patentable over the cited prior art for at least the same reasons.

Claim 17 has been amended analogously to claim 1 and is thus patentable over the cited prior art for the reasons discussed above. Claims 18 and 19 depend upon claim 17 and are thus patentable for at least the same reasons.

Claims 9 – 16, 20, and 21 are cancelled without prejudice. Applicant reserves the right to pursue these claims in a divisional application.

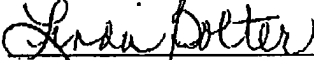
The specification has been amended to provide the missing serial numbers for the incorporated reference.

CONCLUSION

For the foregoing reasons, Applicant submits that pending Claims 1-8 and 17 - 19 are allowable, and a notice of allowance is respectfully requested. If the Examiner has any questions regarding the application, the Examiner is invited to call the undersigned Attorney at (949) 752-7040.


Certification of Facsimile Transmission

I hereby certify that this paper is being facsimile transmitted to the U.S. Patent and Trademark Office on the date shown below.


Linda Bolter

November 2, 2004
Date of Signature

Respectfully submitted,


Jonathan W. Hallman
Attorney for Applicant(s)
Reg. No. 42,622

**This Page is Inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ **BLACK BORDERS**
- ☐ **IMAGE CUT OFF AT TOP, BOTTOM OR SIDES**
- ☐ **FADED TEXT OR DRAWING**
- ☐ **BLURRED OR ILLEGIBLE TEXT OR DRAWING**
- ☐ **SKEWED/SLANTED IMAGES**
- ☐ **COLOR OR BLACK AND WHITE PHOTOGRAPHS**
- ☐ **GRAY SCALE DOCUMENTS**
- ☐ **LINES OR MARKS ON ORIGINAL DOCUMENT**
- ☐ **REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY**
- ☐ **OTHER:** _____

IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.